ABSTRACT OF THE DISCLOSURE

[145] An extreme ultraviolet (EUV) AIM tool for both the EUV actinic lithography and high-resolution imaging or inspection is described. This tool can be extended to lithography nodes beyond the 32 nanometer (nm) node covering other short wavelength radiation such as soft X-rays. The metrology tool is preferably based on an imaging optic referred to as an Achromatic Fresnel Optic (AFO). The AFO is a transmissive optic that includes a diffractive Fresnel zone plate lens component and a dispersion-correcting refractive lens component. It retains all of the imaging properties of a Fresnel zone plate lens, including a demonstrated resolution capability of better than 25 nanometers and freedom from image distortion. It overcomes the chromatic aberration of the Fresnel zone plate lens and has a larger usable spectral bandwidth. These optical properties and optical system designs enable the development of the AFO-based AIM tool with improved performance that has advantages compared with an AIM tool based on multilayer reflective mirror optics in both performance and cost: